Nov. 1, 1932. J. L. BREESE, JR 1,886,156

HEATER

Filed Nov. 7, 1930

Fig. 1.

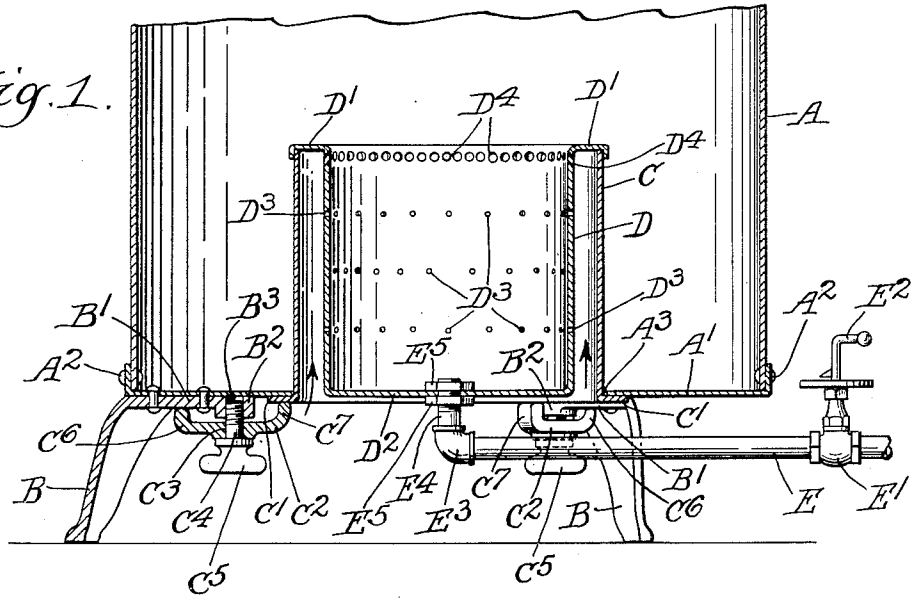
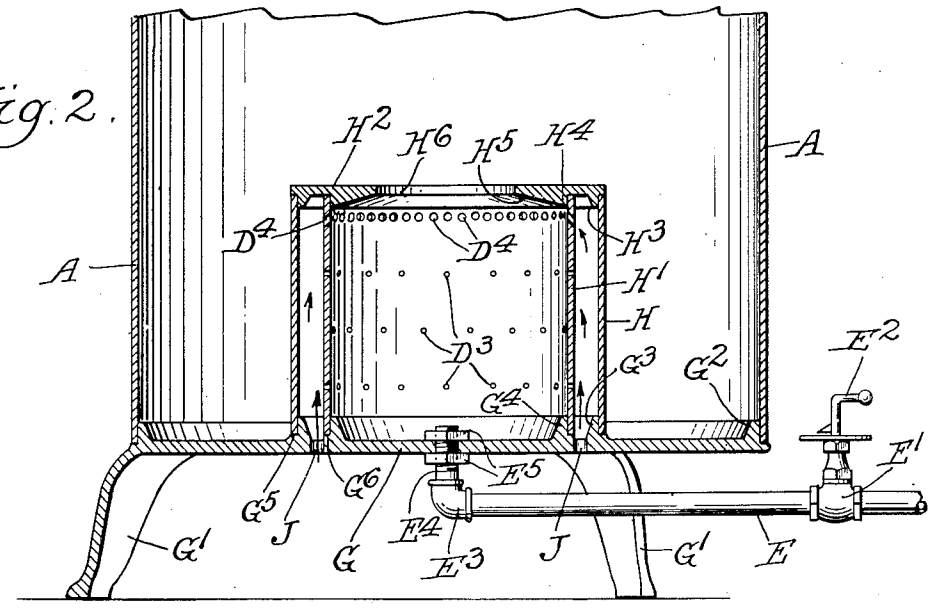


Fig. 2.



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UNITED STATES PATENT OFFICE

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HEATER

Application filed November 7, 1930. Serial No. 493,939.

My invention relates to a burner or heater and may for example be employed with heaters or burners or stoves for burning a fluid hydrocarbon. One object of my invention is to provide a heater or combustion unit which is demountable, and in particular, from which the mixing chamber may readily be removed. Another object is the provision of ready means for taking down or cleaning the mixing chamber. Another object is the provision of improved means for admitting the air supply to the mixing chamber. Other objects will appear from time to time in the course of the specification and claims.

I illustrate my invention more or less diagrammatically in the accompanying drawing, wherein—

Figure 1 is a vertical section; and

Figure 2 is a vertical section through a variant form of my device.

Like parts are indicated by like symbols throughout the specification and drawing.

Referring to the drawing, A generally indicates a radiation and combustion chamber, which may for example be cylindrically walled, but the form, size and proportion of which may be varied to suit varying conditions. A^1 indicates a bottom portion of the member A, both being herein shown as of sheet metal and secured together as at A^2. Whereas I have indicated bolts or rivets, it is clear that any other suitable securing means may be employed.

Secured to the member A are a plurality of supporting feet B, herein shown as provided with inwardly projecting integral flanges B^1 with bosses B^2 provided with screwthreaded apertures B^3.

Adapted to penetrate and closely fit in the central aperture A^3 of the bottom member A^1 is the cylindrical wall member C, the lower and outwardly projecting flange C^1 of which is adapted snugly to engage the bottom of the member A^1. It may for example be locked in position by the locking brackets C^2 which are apertured as at C^3 to permit the passage therethrough of the securing screws C^4 screwthreaded into the aperture B^3. C^5 indicates any suitable manual member for locking and unlocking rotation of the screw C^4. The member C^2 is provided with an outer extension C^6 abutting against the member B^1, and an inner extension C^7 abutting against the flange C^1. It will be understood that when the screws are rotated into locking position the flange C^1 is firmly clamped against the bottom of the member A^1, in substantial air-tight relationship.

Mounted upon or, if desired, formed integral with the cylindrical wall C, is an inner apertured wall D. It is connected to the wall C, as an upper outer extension or flange D^1. D^2 indicates a bottom, which may be integral with the wall D. The wall is provided with any suitable apertures, for example the primary air supply apertures D^3 distributed about the lower and intermediate portion of the wall D, and the secondary air apertures D^4, positioned adjacent the upper edge of the wall D. The apertures D^4 may if desired be upwardly as well as inwardly inclined, as shown, so that the secondary air supply is directed upwardly as well as inwardly about the mixture of air and fuel rising upwardly from the interior of the mixing chamber formed by the wall D and the bottom D^2.

E indicates a fuel supply pipe extending from any suitable source of fuel. It may for example be controlled by the valve E^1 illustrated with the manual control handle E^2. The pipe E may be connected, as by the elbow E^3, with the vertically extending pipe E^4 in communication with the interior of the mixing chamber. Preferably it terminates somewhat above the bottom D^2 and may be locked in relation to the bottom, as by the securing and spacing nuts E^5 E^5, with which it may be in screwthreaded relation.

Referring to the form of Figure 2 I illustrate a unitary bottom member G to which the legs G^1 may be secured or with which they may be unitarily or integrally formed. G^2 indicates an interior positioning flange about the exterior of which the cylinder or wall A may be slipped. G^3 and G^4 indicate inner, for example annular flanges or upward projections from the bottom G, provided with exterior vertically horizontally walled seats G^5 G^6.

H indicates an outer and H^1 an inner wall for a mixing chamber, seated respectively on the seats G^5 G^6. It will be noted that the wall H is blank, like the wall C of Figure 1, whereas the wall H^1 is provided with apertures D^3 and D^4, similar to those employed in connection with the inner wall D of Figure 1. H^2 generally indicates a gap or ring seated upon the walls H H^1 and positioned for example by the downwardly extending annular flange H^3 and the downward enlargement H^4. H^5 indicates an upwardly and inwardly inclined face of the enlarged portion H^4, which terminates in the central aperture H^6.

The bottom G is apertured as at J, preferably a series of rather large apertures, to admit air into the space between the walls H and H^1. It will be realized that as to both forms of the device, any suitable exhaust aperture or flue or draft arrangement may be made for the combustion and radiation chamber formed by the wall A.

It will be realized that whereas I have described and shown a practical and operative device, nevertheless many changes might be made in the size, shape, number and disposition of parts without departing from the spirit of my invention. I therefore wish my description and drawing to be taken as in a broad sense illustrative and diagrammatic rather than as limiting me to my specific showing.

The use and operation of my invention are as follows:

My device is adapted for example to types of burners wherein fluid hydrocarbons, for example liquid hydrocarbons, are burned by hydroxylation. That is to say, a liquid hydrocarbon may be introduced, to the space between the wall D or H^1, where it is mixed with primary air entering through the apertures D^3. The primary mixture so formed rises upwardly through the mixing chamber and is penetrated by or surrounded by or mixed with a secondary air supply entering through the apertures D^4. The mixture so formed is burned in the upper portion of the mixing chamber or above the mixing chamber within the wall A. This combustion, largely above the top of the mixing chamber, heats the space within the wall A, whence the heat is radiated. The combustion also takes place sufficiently close to the mixing chamber to cause vaporization or gasification of the liquid hydrocarbon supply along the line E, and this gasified hydrocarbon, first mixed with the primary air supply, and then with the secondary air supply, is burned off in the combustion and radiation chamber. The mixing chamber being housed within the wall A, is substantially insulated from the cold outer air, by the heated products of combustion within the wall A. The air as it flows up within the wall C or H is subjected to the heating action of the space within the wall A, which assists in rapid and complete combustion.

The structure is readily demountable. In the form of Figure 1 the mixing chamber unit may be removed upon merely unscrewing the screws C^4. In the form of Figure 2 frictional slip joints are shown, and the walls A, H and H^1 may simply be lifted off of the base G. The number of parts to be manufactured is small and the device is easily, quickly and cheaply assembled.

I claim:

1. In a stove for use with fluid hydrocarbons, a radiation chamber member and a supporting base therefor, a mixing chamber member positioned within said radiation chamber, said member including an outer wall extending upwardly from an aperture in the bottom of said base and removably positioned in relation to said base, and an inner wall supported upon and spaced inwardly from said outer wall, said inner wall including portions extending outwardly for contact with the upper edge of said outer wall, said inner wall being pierced by a plurality of air apertures, the space between the outer and inner walls being accessible to an exterior air supply, and a fuel line extending to the space within the inner wall, said inner wall having associated with it a bottom closure portion independent of said base and supported upon said inner wall.

2. In a stove for use with fluid hydrocarbons, a radiation chamber member and a supporting base therefor, a mixing chamber member positioned within said radiation chamber, said member including an outer wall extending upwardly from an aperture in the bottom of said base and removably positioned in relation to said base, and an inner wall supported upon and spaced inwardly from said outer wall, said inner wall including portions extending outwardly for contact with the upper edge of said outer wall, said inner wall being pierced by a plurality of air apertures, the space between the outer and inner walls being accessible to an exterior air supply, and a fuel line extending to the space within the inner wall, said inner wall having associated with it a bottom closure portion independent of said base and supported upon said inner wall, said outer wall having an outwardly extending portion, or portions, adapted to overlie the supporting base, and locking means adapted normally to engage said portions and to hold the outer wall and the entire mixing chamber assembly in position, said locking means being adapted to permit ready removal of the outer wall and mixing chamber assembly downwardly through said base.

3. In a stove for use with fluid hydrocarbons, a radiation chamber member and a supporting base therefor, said base including a

bottom portion having an aperture adjacent its center, and a mixing chamber member adapted to be positioned within said radiation chamber and to penetrate said aperture, and readily removable locking means adapted normally to hold said mixing chamber member in position within the radiation chamber member, said mixing chamber member including an outer wall, an inner wall spaced inwardly therefrom, said inner wall having a plurality of apertures, the space between outer and inner walls being in communication with the atmosphere and being otherwise shut off from the space within the radiation chamber, and a fuel line extending to the space within the inner wall.

Signed at Santa Fe county of Santa Fe and State of New Mexico, this 3rd day of November 1930.

JAMES L. BREESE, JR.